



## **The Need for a Research Room in a Proton Therapy Center –Dresden perspective**

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Particle therapy (PT) has emerged as an important innovative technology for tumor treatment. It is demonstrably superior to conventional radiotherapy with MV X-rays and electrons in more and more applications and is therefore becoming increasingly important. Nevertheless, extensive research is still required to fully exploit its full potential. A better understanding of the relative biological effectiveness, the long-term consequences of the generated secondary particles (e.g. neutrons) and the range verification of the therapeutic particles are just a few selected examples of intensive research.

In addition to fundamental research at research accelerators, such clinical research is also carried out at many of the more than 100 proton therapy facilities worldwide. However, the treatment room is often unsuitable for such activities, as it is primarily designed for safe and efficient patient treatment. In addition, the available beam parameters in the treatment room are often limited in order to guarantee reliable dose application.

An additional room for clinical research makes it possible to carry out and optimize systematic long-term studies over a period of several days or weeks without influencing patient operations. A wide range of non-clinical beam parameters enables the development of technologies beyond the current state of the art.

This presentation gives an overview of the advantages of such an experimental area on the example of the OncoRay in Dresden and shows which different research topics are be worked on there.

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